

The first record of the rarely observed rat snake, *Elaphe urartica* Jablonski et al., 2019 (Squamata, Colubridae) for Iraq

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Abstract

The Urartian rat snake, *Elaphe urartica* Jablonski, Kukushkin, Avcı, Bunyatova, Ilgaz, Tuniyev & Jandzik, 2019, is a recently described species within the genus *Elaphe*, found in eastern Anatolia, Caucasian region and the northern Middle East. It stands as one of the rarely observed snake species, with its distribution and other aspects of natural history largely unexplored. This is particularly true for the territories of Iraq and Iran. Therefore, we report on the presence of the species in Iraq, the first documented evidence of the species' distribution within the country. In conjunction with this record, we provide initial data regarding the species' habitat and ecology in the region. The distribution record presented here is further supplemented by a new species record from the border regions between Iraq and Iran, encouraging further herpetological exploration within the Zagros Mountains.

Key Words

Colubridae, distribution, *Elaphe quatuorlineata* group, Iran, Kurdistan, rat snake

The Urartian rat snake, *Elaphe urartica*, was described in 2019 following molecular and biogeographic analyses that revealed its differentiation from the closely related species *E. sauromates* (Pallas, 1814), both belonging to the *E. quatuorlineata* group (Jablonski et al. 2023). Presently, this species is known to inhabit various regions, including the Armenian Highlands, the southeast and east foothills of the Great Caucasus, the northern Zagros and Alborz mountains, along with the associated Kura-Aras lowlands. Its distribution spans eastern Turkey, Georgia, Armenia, Azerbaijan, Nagorno-Karabakh, Iran, and Dagestan (Russia) (Arakelyan et al. 2011; Jablonski et al. 2019). In literature, its easternmost range extends to Iran's Semnan and Golestan provinces, with the southernmost boundary noted in Kermanshah province (Safaei-Mahroo et al. 2015; Kamali 2020). Surprisingly, there is also a record of an

isolated population from northeastern Khorasan provinces mentioned by Darvish and Rastegar-Pouyani (2012) (under the name *E. quatuorlineata*). Two museum specimens are known from Iran in publicly available databases: FMNH 130818 (locality unknown) and SMNS-Z-HE-2990 (Tehran). However, there is a lack of recent systematic examination of records within Iranian provinces regarding the presence of *E. urartica*, with existing records often relying on older sources and being frequently inaccurate (e.g., Latifi 1991). Although data from neighboring Turkey are missing, the probability of the species' presence in the West Azerbaijan and Kurdistan provinces of Iran is expected. The species' presence there is mentioned by Kamali (2020) (under the name *E. sauromates*) but again lacking comprehensive details. Similarly, Sindaco et al. (2013) mentioned the species' presence in the Iraq – Iran

border but with uncertainty. Consequently, Jablonski et al. (2019, 2023) have indicated a questionable status for the species' range in these regions due to these conflicting data. Thus, the species' presence in this region remain elusive and recent, well supported data are, according to our best knowledge, unknown. Although the presence of the species in different parts of Zagros mountains is expected (Sindaco et al. 2013), there is no official report from the territory of Iraq (Jablonski et al. 2019). Thus, given the scarcity or fragmentation of data, every observation in these poorly explored areas is important.

We here report the first record of *E. urartica* in Iraq, discovered in the easternmost mountain part of Iraqi Kurdistan. The species was found and killed by a local man who alerted us about the presence of big snakes living in his yard. The observations came from Laradar village (35.7339°N, 46.2065°E, 1984 m a. s. l.) of the Penjween area in the Sulaymaniyah Governorate approximately 1 km from the Iranian border (Fig. 1A). From May to July 2023, locals informed us about four killed snakes. They were observed and photographed on 31 May (Fig. 2A) at 1:40 pm, 20 June (Fig. 2B) at 11:25 am, 6 (Fig. 2C) at 9:40 am and 25 July 2023. All individuals were adult specimens with the total length up to 1200 mm. The basic morphology and coloration clearly correspond with characters of *E. urartica*, particularly having a pattern formed by black, irregular

but rounded blotches on the dorsal part of the body with a row of dark flanks on the yellowish background laterally. The dorsal part of the head of all specimens was typically black with the postocular stripe extending towards the mouth corner. The coloration and pattern among observed individuals slightly differentiated (see Fig. 2A–C).

To search for this species and see the habitat, we visited the location on 6 September 2023. We spent several hours searching in the environment where snakes had been previously sighted. Unfortunately, we did not come across any individuals. Interestingly, a local resident mentioned observing this species for the first time in this area what indicates the rarity of species. Local people are active in the wild mostly during spring months when they collect herbs and mushrooms. According to their information, they killed snakes because they believe that “*due to their size, they are venomous and pose a threat to humans.*” Regrettably, encounters with snakes in Iraqi Kurdistan often result in the killing of nearly all individuals, a common occurrence. This trend significantly impacts the conservation of local reptiles, emphasizing the urgent need for enhanced education among local people about the snake fauna of Iraqi Kurdistan. The presence of the large and highly venomous *Macrovipera lebetinus* (Linnaeus, 1758) frequently prompts locals to proactively eliminate any sizable snakes. We made efforts to explain that this

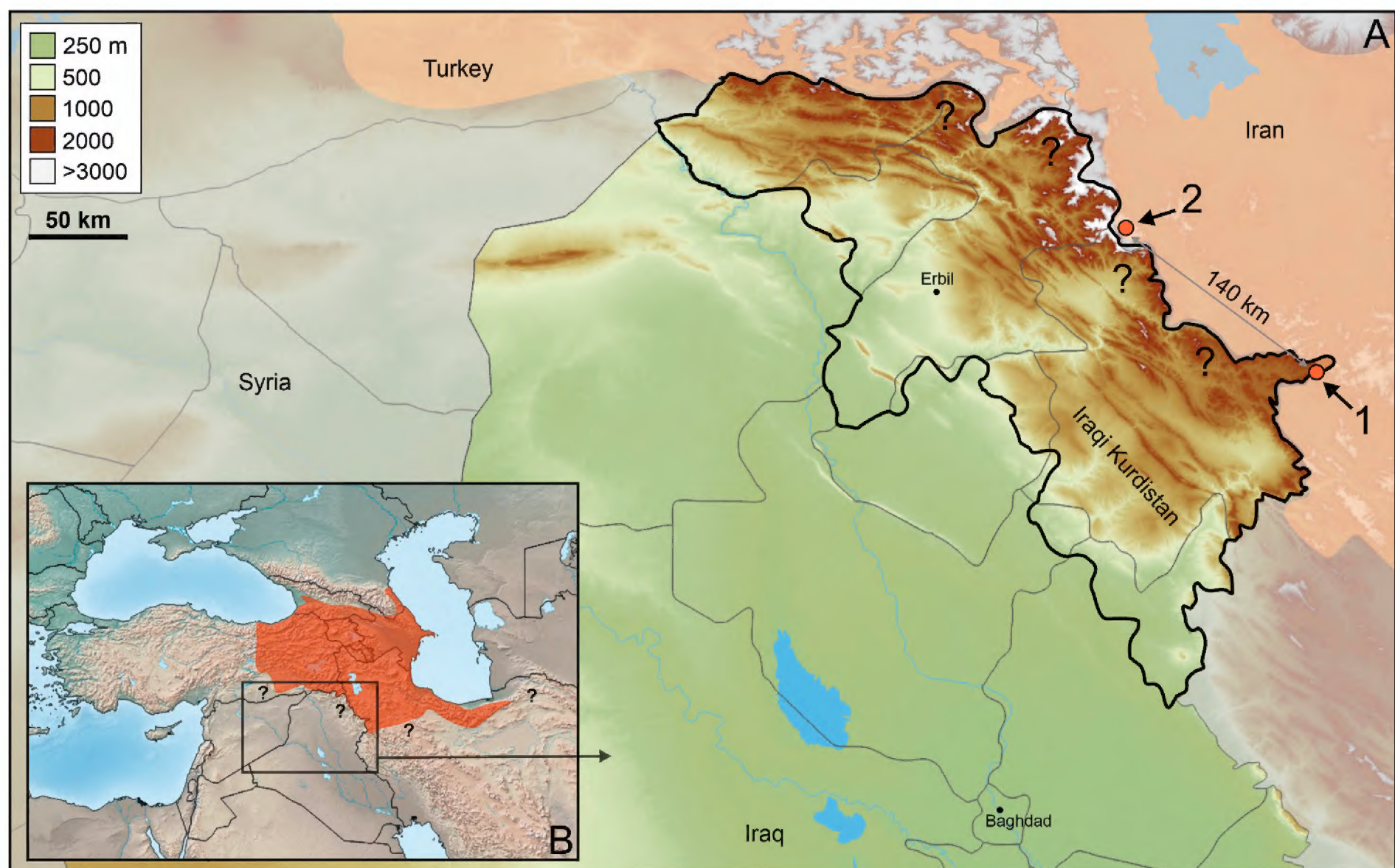


Figure 1. A. Depicts the physical map of northern Iraq (delineating Iraqi Kurdistan with a solid line) with the first record of *Elaphe urartica* in Iraqi Kurdistan (1) and the record from Iran (2), positioned three kilometers away from the Iraqi border. The question mark indicates potential areas where further field research is necessary to ascertain the species' presence. The orange shading represents the anticipated distribution range within the southern region of Turkey and western Iran; B. Depicts the distribution range of the species based on the combination of Sindaco et al. (2013), Kamali (2020), and Jablonski et al. (2023). Question marks denote regions where the presence of the species is uncertain and/or requires verification.

snake species is exceedingly rare and poses no threat. Fortunately, the locals assured us that they would take measures to protect *E. urartica* in the future. The habitat where these individuals were observed lies near the timberline zone at an elevation of nearly 2,000 meters. It primarily consists of a mixed oak forest dominated by *Quercus lebani*, *Q. infectoria*, *Q. aegilops*, *Pistacia eurycarpa*, and *Acer monspessulanum*. Additionally, agricultural lands are also present in the area (see Fig. 2E). The mountain peaks are covered with vegetation dominated by *Astragalus* spp. and *Daphne* sp. The temporary mountain streams are also found in the area, but they are extensively utilized by people for irrigation purposes and during summer months most of them disappear.

As *E. urartica* is currently considered a rarely observed species of the snake fauna of the Western Palearctic (Jablonski et al. 2019), the first record for Iraqi Kurdistan has importance for the protection of local populations. We would like to highlight several threats that this species could

face there: 1) forest fires threatened the general habitat of the area. The sources of forest fires include mine explosions, army conflicts and bombardments, deliberate human firing, other anthropogenic factors, and sometimes fires come from the Iran border; minefields in the area made the forest fire impossible to control, 2) habitat loss and deforestation in the entire habitat of the area is under threat of extensive land use for agricultural purposes (manipulating surface and ground water sources for irrigation, cutting natural forest for expansion of agricultural lands, cutting trees for fuel and charcoal, and using pesticides), 3) killing of this species by local people due to a lack of awareness about snakes, thinking they all are venomous (see above). It is thus beholden on local conservation and education authorities to provide protection and obtain more information about this new, big but rare snake species of Iraqi Kurdistan.

To highlight the importance of distribution of *E. urartica* in Iran and Iraq and place the Iraqi record in context, we also report on two observations of the species from the



Figure 2. Individuals of *Elaphe urartica* from Iraq (A–C. Photography by Hemn Penjweeny) and Iran (D. Photography by Azad Shamsi) reported in this study; E. The species habitat (photography by Soran H. Ahmed) in Laradar village, Penjween area, Sulaymaniyah Governorate, Iraqi Kurdistan.

border area on the Iranian side. The species was observed on 14 May 2015 and 30 May 2023 at 11:07 am in Qandil Mountains (36.5323°N, 45.0577°E, 2,580 m a.s.l.). The observations were provided and photographed by local mountaineer Azad Shamsi. The first observations possess one individual sitting and basking in mountain vegetation (Fig. 2D), the second observation includes two snakes found during mating. Both observations come from the mountain valley, approximately 3 km (straight line) from the Iraqi border in the Kurdistan Province of Iran (neighboring the northeastern part of the Sulaymaniyah Governorate of the Iraqi Kurdistan and not so far from the border with the Erbil Governorate). This record is approximately 140 km distant (straight line) from the first species record in Iraq mentioned above. At the same locality in Iran, *Montivipera raddei* (Boettger, 1890) was also observed.

As is evident, the range of *E. urartica* in Iraq has a peripheral character (Fig. 1) but the species may extend to other parts of northwestern Zagros Mountains. Both records presented here significantly improve our knowledge about species distribution and provide well documented records for both countries. Moreover, they also confirm published suggestions that this species is present in these areas of Iran (Kamali 2020) and can be possibly found in the same areas of Iraq (Sindaco et al. 2013), i.e., Erbil and Sulaymaniyah Governorates. The presence in Dohuk Governorate of northern Iraq is also not excluded, and further research should answer the question about the distribution range of the species in both countries.

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